

Application No.: 10/706,861
Amendment Dated July 19, 2007
Reply to Office Action of April 19, 2007

REMARKS

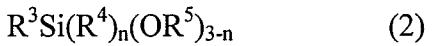
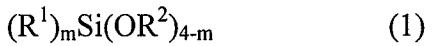
The preamble of Claim 11 has been amended to recite “[a] semiconductor device comprising an internal porous film which is formable by a composition for forming said porous film...” Claims 1-2, 4-12 and 14-16 are pending.

Rejection under 35 U.S.C. §112

Claim 11 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Office argues that “it is not clear whether the internal porous film contains the following composition or the silica film is derived from the said composition.” The Office acknowledges that this rejection can be overcome by adding the phrase “said film” in the second line of the preamble. Accordingly, Claim 11 has been amended to recite “[a] semiconductor device comprising an internal porous film which is formable by a composition for forming said porous film...” Therefore, Applicants request withdrawal of this rejection.

The Claimed Invention

As currently claimed, independent claims 1 and 11 recite, respectively, a composition for forming a porous film (Claim 1) and a semiconductor device comprising an internal porous film (Claim 11) comprising one or more alkoxysilanes represented by Formula (1) and one or more alkoxysilanes represented by Formula (2):



The one or more alkoxysilanes represented by Formula (1) comprise one or more tetraalkoxysilanes wherein m=0 and one or more alkoxysilanes wherein m=1, 2, or 3. Further, said one or more alkoxysilanes represented by Formula (2) are present in an amount of 0.01 to 10 parts by weight to 100 parts by weight of said one or more alkoxysilanes represented by Formula (1).

Rejections under 35 U.S.C. §103(a)

To establish a *prima facie* case of obviousness the prior art references must teach or suggest all claim limitations. Furthermore, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference teachings. Accordingly, the Office has not established a *prima facie* case of obviousness because the references cited do not teach or suggest each and every claimed limitation and also lack the necessary motivation for modifying the respective teachings.

Claims 1-2 and 4-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,755,867 to Chikuni et al. (hereinafter “Chikuni”). Chikuni is generally directed to a photocatalytic hydrophilic coating composition that “maintains water affinity semi-eternally...” See Abstract. Chikuni discloses a composition comprising (A) a coat-forming element and (B) a photocatalyst dispersed therein. The coating element of the composition is an organopolysiloxane formed from a mixture of (a) 0 to 60 mol% of $R^1_2SiX_2$, (b) 10 to 100 mol% (preferably 30 to 80%; column 8, lines 8-9) of R^1SiX_3 , and (c) 0 to 30 mol% of SiX_4 (column 6, lines 3-12). The photocatalyst is included so that when the composition cures and is exposed to light, the photocatalyst “exerts photocatalysis upon photo excitation such that at least some of the organic groups attached to silicon atoms of silicone molecules at the surface of the coating are replaced by hydroxyl groups in the presence of water, thereby rendering the coating surface hydrophilic. See column 2, line 66, through column 3, line 3. The Office argues that $R^1_2SiX_2$ is equivalent of Formula (1) ($m=2$) of the currently claimed invention, R^1SiX_3 is equivalent to Formula (2) of the currently claimed invention and SiX_4 is equivalent to Formula (1) ($m=0$) of the currently claimed invention. Further, the Office speculates that if the molar ratios were in fact calculated on a weight ratio basis, “the low end of the prior art ratios would overlap the instant claimed component ratios.” However, the Office provides no support for this assertion.

Chikuni does not teach or suggest a composition including one or more alkoxy silanes represented by Formula (2) present in an amount of 0.01 to 10 parts by weight to 100 parts by weight of one or more alkoxy silanes represented by Formula (1). As shown above, Chikuni teaches compositions comprising large amounts of R^1SiX_3 , namely 10 to 100 mol% and preferably between 30 to 80 mol%. To the contrary, independent claim 1 recites a composition

including a substantially smaller amount of alkoxy silanes represented by Formula (2), namely 0.01 to 10 parts by weight to 100 parts by weight of one or more alkoxy silanes represented by Formula (1).

The present specification teaches that the recited ratio between alkoxy silanes represented by Formula (1) and Formula (2) is beneficial for achieving a composition exhibiting the desirable combination of properties that enables the currently claimed composition to form a porous film with excellent dielectric properties, adhesion, mechanical strength, and reduced water vapor adsorption. Page 6, lines 11-18 teaches that "... an amount of the component comprising a long chain alkyl group is reduced [Formula (2)], while the content of the tetraalkoxy silane component [Formula (1)] necessary for keeping the film strength is kept high. In addition, because the component comprising a long chain alkyl group which is expected to have bad influence on the film strength is located on the surface, the main frame can maintain the film strength derived from the tetraalkoxy silane." Further, when less than 0.01 parts by weight of the alkoxy silane represented by Formula (2) is added, the hydrophobic properties can be insufficient. On the other hand, when more than 10 parts by weight are added, the film strength is negatively impacted. See page 13, lines 6-11. Thus, according to the currently claimed invention, the amount of one or more alkoxy silanes represented by Formula (2) is important to obtaining a composition that exhibits the aforementioned desirable properties. For instance, the amount of one or more alkoxy silanes represented by Formula (2) has to be reduced to enable a film having high strength.

Chikuni is silent regarding compositions including one or more alkoxy silanes represented by Formula (2) present in a reduced amount (e.g. 0.01 to 10 parts by weight to 100 parts by weight of one or more alkoxy silanes represented by Formula (1)). Further, since Chikuni is concerned with providing water sealant-type coatings (i.e. not porous), Chikuni is silent regarding the desirability of utilizing a reduced amount of alkoxy silanes represented by Formula (2) in relation to alkoxy silanes represented by Formula (1). For instance, Chikuni does not provide a specific example of a combination of alkoxy silanes in which long chain alkyl alkoxy silanes represented by Formula (2) are provided in combination of alkoxy silanes represented by Formula (1). Despite providing numerous examples, Chikuni does not illustrate a

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combination of alkoxy silanes as currently recited in independent claim 1. For example, Example 3 of Chikuni provides information related to the synthesis of 8 siloxane solutions and not a single solution illustrates the combination of alkoxy silanes as currently recited. For these and other reasons, one skilled in the art would not arrive at the currently claimed invention by reading Chikuni. As such, Chikuni fails to provide the necessary motivation or suggestion to modify its teachings to arrive at the currently claimed invention as suggested by the Examiner.

Since Chikuni does not teach or suggest each and every element of the claimed invention and the necessary motivation for modifying the prior art is also lacking, Chikuni does not render independent claim 1 or any claims dependent thereon as obvious. Accordingly, Applicants respectfully request withdrawal of this rejection.

Claims 11-12 and 14-16 stand rejected under 35 U.S.C. §103(a) as being obvious over JP 2002/030249 to Egami et al. (hereinafter “Egami”). Egami discloses a liquid comprising at least one silicon compound selected from the group consisting of alkoxy silanes of the general formula (I): $X_nSi(OR)_{4-n}$. Egami also discloses in paragraph [0015] that examples of alkoxy silanes of general formula (I) include octyl trimethoxysilane and octyl triethoxysilane.

However, Egami fails to teach or suggest a composition including one or more alkoxy silanes represented by Formula (2) present in an amount of 0.01 to 10 parts by weight to 100 parts by weight of one or more alkoxy silanes represented by Formula (1) as recited in independent claim 11. In fact, Egami does not teach or suggest any relative amounts of alkoxy silanes represented by Formula (2) with respect to alkoxy silanes represented by Formula (1). Accordingly, Egami provides absolutely no guidance regarding the relative amounts of compounds according to Formula (1) and Formula (2). Consequently, Egami is also silent regarding the desirability of formulating a composition including the recited amount of alkoxy silanes represented by Formula (2) in relation to alkoxy silanes represented by Formula (1) according to currently claimed independent claim 11. As such, the necessary motivation for modifying the Egami to arrive at the currently claimed invention is lacking. Therefore, Egami necessarily does not teach or suggest a composition including one or more alkoxy silanes represented by Formula (2) present in an amount of 0.01 to 10 parts by weight to 100 parts by weight of one or more alkoxy silanes represented by Formula (1). Since Egami does not teach or

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suggest each and every element of the currently claimed invention, Applicants respectfully request withdrawal of this rejection.

Conclusion

In view of the foregoing amendment and remarks made above, Applicants submit that the pending claims are in condition for allowance. Applicants respectfully request that the claims be allowed to issue. If the Examiner wishes to discuss the application or the comments herein, the Examiner is urged to contact the undersigned

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



John E. Johnson, III
Registration No. 58,367

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111
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